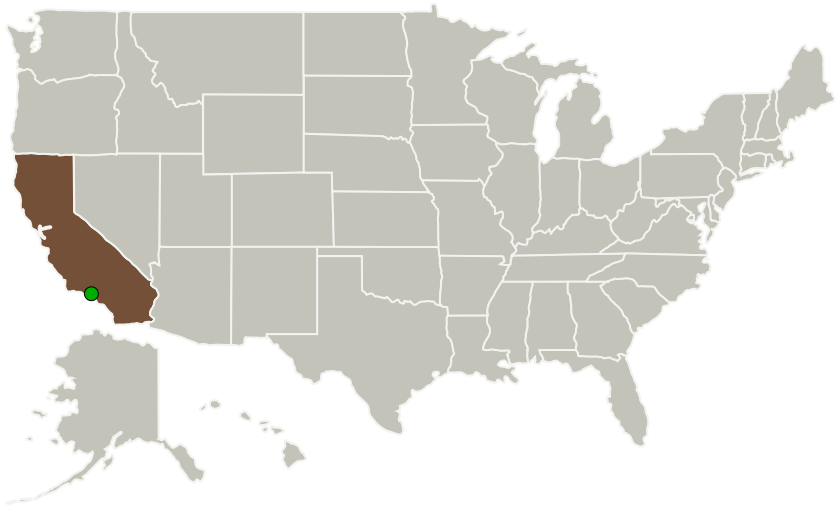
Sealed Planetary Return Canister (SPRC), Phase II

Completed Technology Project (2011 - 2013)

Project Introduction

Sample return missions have primary importance in future planetary missions. A basic requirement is that samples be returned in pristine, uncontaminated condition, necessitating development of a canister system capable of maintaining cleanliness and seal integrity through a variety of environments. Further development of the Sealed Planetary Return Canister (SPRC), is proposed after a successful Phase 1 program. Besides providing a high integrity seal, the canister incorporates features for robotic manipulation and to allow the sample to be accessed in a controlled manner upon return to Earth. The SPRC seal system addresses the two most significant concerns for planetary samples ⬌ seal surfaces contaminated by the sample and high pressure due to the phase change of volatiles. The SPRC incorporates a novel sealing system evolved from the only marginally successful Apollo indium knife edge seal approach but with added features to address the difficulties and inconsistencies observed. The indium is contained within a protective barrier to prevent against contamination, and the knife edge is mechanically cleaned during the sealing process. The container body can be configured to accommodate a variety of samples including rock cores, rock fragments, regolith, dust, and frozen soil. Atmospheric samples can also be preserved. The design is readily scalable and adaptable to specific missions. The prototype developed in Phase 1 demonstrated a leakage rate of less than 1e-6 cc-atm/s, meeting the primary science requirement.

Primary U.S. Work Locations and Key Partners



Sealed Planetary Return Canister (SPRC), Phase II

Table of Contents

Sealed Planetary Return Canister (SPRC), Phase II

Completed Technology Project (2011 - 2013)

Organizations Performing Work	Role	Type	Location
Techno Planet Incorporated	Lead Organization	Industry Women-Owned Small Business (WOSB)	Northridge, California
Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations
California

Project Transitions

June 2011: Project Start

December 2013: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139311)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Techno Planet Incorporated

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Scott P Stanley

Co-Investigator:

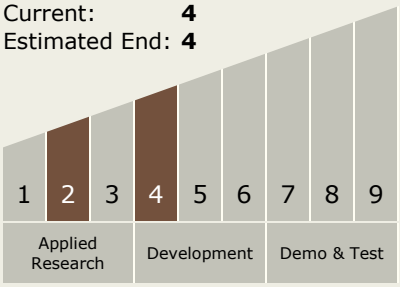
Scott Stanley

Sealed Planetary Return Canister (SPRC), Phase II

Completed Technology Project (2011 - 2013)

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



Technology Areas

Primary:

- TX04 Robotic Systems
  - TX04.3 Manipulation
    - TX04.3.4 Sample Acquisition and Handling

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System